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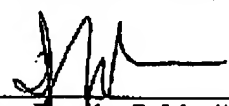
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Applicant: HAYASHI ET AL.
Serial No.: 10/008413
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Group Art No.: 1745

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S/N 10/008413

PATENT**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: HAYASHI ET AL. Examiner: J.A. MERCADO
Serial No.: 10/008413 Group Art Unit: 1745
Filed: NOVEMBER 13, 2001 Docket No.: 10873.836US01
Title: COBALT COMPOUND FOR USE IN ALKALINE STORAGE BATTERY,
METHOD FOR MANUFACTURING THE SAME, AND POSITIVE
ELECTRODE PLATE OF ALKALINE STORAGE BATTERY
EMPLOYING THE SAME

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By: 
Name: LISA DORN

APPELLANTS' BRIEF ON APPEAL

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Dear Sir:

This Brief is presented in support of the Notice of Appeal filed March 14, 2006, from the
final rejection of Claims 26-32 in the above-identified application, as set forth in the Office
Action mailed November 2, 2005 and maintained in the Advisory Action mailed February 15,
2006.

Please deduct the amount of \$500.00 from Deposit Account No. 50-3478 to cover the
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I. REAL PARTY OF INTEREST

The application pending on this appeal has been assigned to Matsushita Electric Industrial Co., Ltd., of Osaka, Japan.

II. RELATED APPEALS AND INTERFERENCES

The Assignee, the Assignee's legal representatives, and the Appellants are unaware of any other appeals or interferences that will affect, be directly affected by or have a bearing on the Board's decision in this Appeal.

III. STATUS OF CLAIMS

Claims 26-32 are pending and are the subject of this Appeal. Claims 1-25 and 33 have been canceled. Appendix A attached herewith provides a copy of the pending claims 26-32 to be reviewed in this Appeal.

IV. STATUS OF AMENDMENTS

An Amendment in response to the final Office Action was filed on January 18, 2006. By way of Advisory Action mailed February 15, 2006, the Amendment was entered and considered but was not found persuasive.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Appellants' claimed invention is an alkaline storage battery including an active material paste containing a nickel hydroxide powder and cobalt compounds that are comprised of a hardly-soluble cobalt compound and an easily-soluble cobalt compound. (Page 7, lines 1-12 and

lines 29-33.) The hardly-soluble cobalt compound has a solubility of not more than 1 $\mu\text{g/g}$ in a potassium hydroxide aqueous solution with a specific gravity of 1.3 and the easily-soluble cobalt compound has a solubility in a range of 100 $\mu\text{g/g}$ to 10000 $\mu\text{g/g}$ in the potassium hydroxide solution with a specific gravity of 1.3. The easily-soluble cobalt compound is at least one selected from cobalt metal, cobalt hydroxide, cobalt monoxide, and cobalt sulfate. (Id.)

The hardly-soluble cobalt compound can be produced, for example, according to any one of a first, second, and third embodiment. (Page 2, lines 21-35.) Such embodiments can involve treating a starting material such as cobalt hydroxide powder (1) with a sodium hydroxide powder and heat, (2) with a hydroxide aqueous solution and an aqueous solution having an oxidizing agent, and (3) by baking the cobalt hydroxide in an oxygen atmosphere. The cobalt hydroxide, after being subjected to any of the above treatments, is converted to a hardly-soluble cobalt compound that is different from the cobalt hydroxide starting material. (Page 7, lines 1-12 and lines 29-33.)

The claimed invention can provide advantages such that a positive electrode may be produced by using an active material paste obtained by mixing a hardly-soluble cobalt compound with an easily-soluble cobalt compound. In an alkaline storage battery as the claimed invention, the hardly-soluble cobalt compound forms a tight network, while the easily-soluble cobalt compound forms a fine network. Such a configuration can provide a conductive network with higher density in the positive electrode plate, thereby enabling high power output. Furthermore, using a hardly-soluble cobalt compound can allow a network to be formed substantially exclusively inside the electrode plate, thereby providing an advantageous effect of suppressing micro-short circuits. (Page 8, line 34 to page 9, line 20.)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether Uramoto et al. (JP 61-183868), in the rejection under 35 U.S.C. §102(b), anticipates claims 26-32, and more particularly whether the reference discloses an alkaline storage battery containing a hardly-soluble cobalt compound.

2. Whether Uramoto et al. (above), in the rejection under 35 U.S.C. §103(a), renders claims 26-32 obvious, and more particularly whether the teachings of the reference reasonably would suggest an alkaline storage battery containing a hardly-soluble cobalt compound.

VII. ARGUMENT

1. Claims 26-32 Are Not Anticipated By Uramoto et al.

Claims 26-32 were rejected under 35 U.S.C. 102(b) as being anticipated over Uramoto et al. Appellants respectfully request reversal of the rejection.

Claim 26 recites an alkaline storage battery that includes an active material paste containing a nickel hydroxide powder and cobalt compounds defined as a hardly-soluble cobalt compound and an easily-soluble cobalt compound, where the hardly-soluble cobalt compound has a solubility of not more than 1 µg/g in a potassium hydroxide aqueous solution. The easily-soluble cobalt compound of claim 26 includes at least one selected from cobalt metal, cobalt hydroxide, cobalt monoxide, and cobalt sulfate. Uramoto et al. fails to disclose explicitly, implicitly or inherently any hardly-soluble cobalt compound as required by claim 26.

The rejection contends that the disclosed cobalt monoxide in Uramoto et al. is readable on an easily-soluble cobalt compound and that the disclosed cobalt hydroxide is readable on a hardly-soluble cobalt compound. Appellants respectfully assert that this interpretation of the

reference is unreasonable. Moreover, this interpretation is unsupported by, and in fact contrary to, the evidence of record.

Uramoto et al. uses as its active material, for example, a powder in a eutectic state that is composed of nickel hydroxide, cobalt hydroxide, and cadmium hydroxide. (Abstract.) The active material defines a material with the lowest melting point possible, thus making it easily melted. However, the cobalt hydroxide is not readable on a hardly-soluble cobalt compound. Both the cobalt monoxide and the cobalt hydroxide mentioned in Uramoto et al. are easily-soluble cobalt compounds and Appellants have explicitly claimed them as such. (Claim 26.) Nothing in the present record establishes that cobalt monoxide or cobalt hydroxide would have the solubility required for the hardly-soluble cobalt compound required by claim 26. Nor does Uramoto et al. disclose the use of any other material that could qualify as the hardly-soluble compound required by claim 26.

In further support of this distinction, note that the hardly-soluble cobalt compound of claim 26 can be obtained by treating a starting material, such as cobalt hydroxide, under conditions that result in an end product different from the starting material. The difference between the hardly-soluble cobalt compound and a cobalt hydroxide, such as used in Uramoto et al., is further demonstrated for example in Appellants' X-ray diffraction analysis charts, which show different peaks for a hardly-soluble cobalt compound as compared to cobalt hydroxide. (Figures 1 and 2.) Moreover, Appellants' compounds 1 to 3, which are examples of the claimed invention, illustrate products with the claimed solubilities, and exhibit color changes different from a cobalt hydroxide starting material. (Examples 1-3 of Appellants' Specification.) However, Uramoto et al. does not disclose any treatment of a starting material that would convert an easily-soluble cobalt compound such as cobalt monoxide or cobalt hydroxide into a

hardly-soluble cobalt compound. For at least these reasons, there is no reasonable basis to assume that the hardly-soluble cobalt compound of claim 26 is present in the materials used in Uramoto et al.

The rejection contends that the treatment steps (e.g. in claims 27, 28 and 30) are not relevant to the product claims. Appellants respectfully disagree. The treatment steps in fact demonstrate the rejection's erroneous interpretation of Uramoto et al. More specifically, as noted above the evidence in the present specification shows that the treatments affect the nature of the material, i.e. significantly changing the solubility, and therefore are relevant to product claims. Moreover, the treatments show that neither of the materials disclosed in the reference reasonably can be interpreted as meeting the required hardly-soluble cobalt compounds of claim 26. Again, Uramoto et al. does not provide any treatment that would convert its cobalt hydroxide to a hardly-soluble cobalt compound. The absence of any such treatments in Uramoto et al. shows that the materials disclosed in the reference in fact are not a hardly-soluble cobalt compound as claimed in claim 26.

The materials mentioned in Uramoto et al. do not inherently possess the solubilities for a hardly-soluble cobalt compound required in claim 26. The rejection contends that "'hardly-soluble' is a relative term, and therefore, at least relative to one another, cobalt hydroxide is less soluble than cobalt oxide." This statement, however, demonstrates the clear error in the rejection, and in particular the failure to take into account the actual language of claim 26. Claim 26 defines numerical limits on the solubilities for the hardly-soluble cobalt and easily-soluble cobalt compounds. The hardly-soluble cobalt compound has a solubility of not more than 1 $\mu\text{g/g}$ in a potassium hydroxide aqueous solution, and the easily-soluble cobalt compound has a solubility in a range of 100 $\mu\text{g/g}$ to 10000 $\mu\text{g/g}$ in the same solution. In fact, the claimed

minimum solubility for the easily-soluble cobalt compounds is two orders of magnitude greater than the claimed maximum solubility for the hardly-soluble cobalt compounds.

However, both cobalt monoxide and cobalt hydroxide, the two cobalt materials mentioned in Uramoto et al., have solubilities in the easily-soluble range. As noted, these two materials previously were identified as and are explicitly claimed by Appellants as easily-soluble compounds. The present record provides no reasonable basis for any assumption that any of the compounds in Uramoto et al. would possess the solubility characteristics required for the hardly-soluble cobalt compound in claim 26. Thus, the reference in no way discloses the presence of any material that could be considered a hardly-soluble cobalt compound.

For at least the foregoing, Uramoto et al. does not disclose the hardly-soluble cobalt compound required by claim 26 and its dependent claims. Therefore, Uramoto et al. does not anticipate claims 26-32.

2. Claims 26-32 Are Not Obvious Under 35 U.S.C. §103(a) Over Uramoto et al.

Claims 26-32 were rejected under 35 U.S.C. 103(a) as being unpatentable over Uramoto et al. Appellants respectfully request reversal of this rejection for at least the following reasons.

As discussed above, Uramoto et al. does not disclose the present of the hardly-soluble cobalt compound required by claim 26. Similarly, Uramoto et al. fails to suggest the hardly-soluble cobalt compound required by claim 26. Uramoto et al. is silent as to the significance of the solubility of cobalt compounds in the context of the Uramoto et al. invention. Moreover, nothing in Uramoto suggests any treatment that would be suitable for converting the easily-soluble cobalt compounds to hardly-soluble cobalt compounds. Therefore, the present record provides neither the motivation for achieving the invention of claim 26 from the prior art nor the

teaching of how the invention of claim 26 could be achieved from the prior art. For this reason alone Uramoto et al. does not render claims 26-32 obvious.

Moreover, the invention of claim 26 can enjoy advantages that Uramoto et al. in no way contemplates. For example, a positive electrode may be produced, in which the hardly-soluble cobalt compound forms a tight network, while the easily-soluble compound forms a fine network. Such a configuration can provide a conductive network with higher density in the positive electrode plate, and can enable a high power output. Further, the hardly-soluble cobalt compound can allow a network to be formed substantially exclusively inside the electrode plate, to provide an effect of suppressing micro-short circuits. (Page 8, line 34 to page 9, line 20.) However, Uramoto et al. discloses nothing about such advantages that can be obtained from including a hardly-soluble cobalt compound in an alkaline storage battery. These advantages remove the invention of claim 26 even further from the disclosure of Uramoto et al.

VIII. CONCLUSION

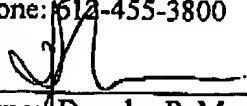
Appellants submit that the rejections are untenable for the reasons set forth above and should be reversed. Please charge any additional fees or credit any overpayment to Hamre, Schumann, Mueller & Larson Deposit Account No. 50-3478.

Respectfully submitted,

Hamre, Schumann, Mueller & Larson, P.C.
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Date: April 28, 2006

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Name: Douglas P. Mueller
Reg. No. 30,300

APPENDIX A-CLAIMS

26. An alkaline storage battery, comprising:
a positive electrode plate comprising a conductive support and an active material paste supported by the support, the active material paste containing nickel hydroxide and cobalt compounds, and
an alkaline electrolyte,
wherein the cobalt compounds comprise a hardly-soluble cobalt compound having a solubility of not more than 1 $\mu\text{g/g}$ in a potassium hydroxide aqueous solution with a specific gravity of 1.3 and an easily-soluble cobalt compound having a solubility in a range of 100 $\mu\text{g/g}$ to 10000 $\mu\text{g/g}$ in the potassium hydroxide solution with a specific gravity of 1.3, and
the easily-soluble cobalt compound is at least one selected from cobalt metal, cobalt hydroxide, cobalt monoxide, and cobalt sulfate.
27. The alkaline storage battery according to claim 26, wherein said hardly-soluble cobalt compounds are obtained by mixing a cobalt hydroxide powder and a sodium hydroxide powder, and applying a heat treatment to the same in an atmosphere containing oxygen.
28. The alkaline storage battery according to claim 26, wherein said hardly-soluble cobalt compounds are obtained by adding a sodium hydroxide aqueous solution and an aqueous solution containing an oxidizing agent to a cobalt hydroxide powder.
29. The alkaline storage battery according to claim 28, wherein the oxidizing agent comprises at least one selected from the group consisting of hydrogen peroxide, bromine, chlorine, sodium hypochlorite, and persulfate.
30. The alkaline storage battery according to claim 26, wherein said hardly-soluble cobalt compounds are obtained by baking a cobalt hydroxide powder in an atmosphere containing oxygen at a temperature in the range of 90°C to 140°C.

31. The alkaline storage battery according to claim 27, wherein the cobalt hydroxide powder is made of a solid solution of cobalt hydroxide containing at least one element selected from nickel, zinc, iron, manganese, aluminum, calcium, magnesium, strontium, barium, lithium, sodium, yttrium, and ytterbium.

32. The alkaline storage battery according to claim 28, wherein the cobalt hydroxide powder is made of a solid solution of cobalt hydroxide containing at least one element selected from nickel, zinc, iron, manganese, aluminum, calcium, magnesium, strontium, barium, lithium, sodium, yttrium, and ytterbium.